THE CORRESPONDENCE BETWEEN AUDITORY DURATION AND GRAPHEME LENGTH: A DEVELOPMENTAL STUDY

FINAL THESIS

Submitted to the Graduate Committee of the
Department of Education and Human Development
State University of New York
in Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Education

by

Jhan L. Sauer

State University of New York
College at Brockport
Brockport, New York

July, 1990

SUBMITTED BY:

Jhan L. Sauer 7-19-90
Date

APPROVED BY:

Duane L. Bigg 7/19/90
Thesis Advisor Date

Arthur E. Smith 7/19/90
Second Faculty Reader Date

Morris J. Beers 7/25/90
Chairman, Graduate Policies Committee Date

Acknowledgement

I would like to thank my Lord and Savior, Jesus Christ, who enabled me to complete this thesis and provided me with a loving, supportive husband. "...as it is written, He that glorieth, let him glory in the Lord. For of him, and through him, and to him, are all things: to whom be glory for ever. Amen."

(I Corinthians 1:31 and Romans 11:36)

Table of Contents

Chapter I

Statement of the Problem

Purpose

The purpose of this study is to explore and document the development of young children's conceptions of the correspondence between the auditory duration and grapheme length of a word.

Questions to Be Answered

1. Is there a statistically significant difference between the metalinguistic abilities of students at each grade level?
2. What strategies do students at each grade level use for explaining their choices on the Speech-Print Matching Test?
3. Do the explanations of students at each grade level reflect an understanding of the relationship between sound duration and the number of graphemes in a word?
4. Are there significant individual differences in metalinguistic abilities among children within the same grade as measured by their performances on the Speech-Print Matching Test?

Need for the Study

The research has clearly shown that prereaders and beginning readers demonstrate limited metalinguistic awareness as manifested in their poor concept of the written and spoken word. Research reveals a weak ability of young children to identify a word, to segment sentences into words, and to match a spoken word to a written word according to its auditory duration and number of graphemes (Downing, 1971-72; Leong and Haines, 1978; and Lundberg and Torneus, 1978). Children are also limited in their ability to use the proper terminology in describing the functions and elements of language (Reid, 1966).

Research also indicates that there is a correlation between linguistic awareness and reading success (rate of reading progress) (Gibb and Randall, 1988). Children who exhibit linguistic awareness continue to develop their metalinguistic skills at a faster rate than others (Downing, 1971-72). Likewise, children who exhibit a lack of linguistic awareness manifest difficulty with the learning-to-read process (Gibb and Randall, 1988). Researchers assumed that children with some intuition about the nature of language would have a better chance of inferring that the relationships between speech and print are ordered and systematic, thus enhancing their reading development. Students must recognize the relationship between spoken and written language in order to fully appreciate and comprehend the printed page. The ability to identify a written word based solely on its auditory duration indicates that a student has some understanding of the relationship between the spoken and written word.

This study is aimed at identifying children's awareness of the correspondence between the auditory duration and grapheme length of a word. This knowledge of children's metalinguistic awareness is essential for program planning and curriculum development. Too often formal systems of education assume much, but know very little about the actual perceptions and abilities that children already possess before systematic instruction in reading and writing begins. Evidence of poor metalinguistic skills may impact reading programs by suggesting the need for greater emphasis to be placed on whole words and syllables, rather than individual phonetic sounds. Results from this study may also alert educators to the need for instruction in metalinguistic awareness prior to formal reading instruction. Research by Templeton and Thomas (1984) support this theory.

> Of specific interest is the emergence of children's concepts of what words are. This question is not only of theoretical interest but of significant practical interest as well; unrealistic assumptions on the part of primary grade teachers regarding students' knowledge of words as units in speech and print, and the nature of the constituent elements in these units, often lead to difficulties and frustration in formal reading instruction. Work in phonics, for example, is frequently undertaken before children understand some basic concepts about words--that they are groups of letters bounded on both sides by spaces, have a beginning, middle, and end, and so forth. Our understanding of the development of young children's concepts of "wordness" should better inform us in the matter of facilitating the development of that concept as well as the development of reading ability in general. (p. 139)

If educators are able to identify the determinants of young children's ability to deal analytically with language or when they become metalinguistically aware they should be able to appropriately plan when to initiate or hold back those activities that assume metalinguistic awareness (Templeton and Spivey, 1980).

<u>Definition</u> <u>of</u> <u>Terms</u>

<u>Content</u> <u>words</u> - These words carry the meaning of the sentence such as nouns, verbs, and adjectives. They are also referred to as contentives.

<u>Function</u> <u>words</u> - These are unstressed grammatical words such as "to," "a," "the," and "do." These are the ar-

ticles and auxiliary verbs. They are also called functors.

Grapheme - A printed letter of the alphabet or a letter combination which represents a single phoneme.

Phoneme - A unit of speech represented by a letter or a group of letters.

Limitations of the Study

The population sample included in this study was representative of middle class suburban children who attend private day cares and private schools. Therefore, the results cannot be applied to other socioeconomic groups.

Chapter II

Review of the Literature

Purpose

The purpose of this study is to explore and document the development of young children's conceptions of the correspondence between the auditory duration and grapheme length of a word.

Overview of the Literature

Metalinguistic awareness has been defined by Pratt and Grieve as, "the ability to think about and reflect upon the nature and functions of language" (cited in Tunmer, Pratt, and Herriman, 1984, p. 2). Holden has more specifically defined it as "the study of young children's emerging and unique conceptualizations of the processes and elements involved in learning to read and write" (cited in Yaden and Templeton, 1986, p. 3). Other synonymous terms often used by researchers are linguistic awareness, language awareness, and print awareness. Each of these phrases indicate that young children exhibit various ideas about literacy as they slowly develop understanding of the tasks involved in reading and writing. Holden, one of the pioneers in the field of metalinguistics, was curious as to what extent innate ability and informal acquisition influenced word awareness. She, along with many others, pursued the research of metalinguistic awareness in young children. Holden's use of the term "metalinguistic" described children's conscious awareness of the lexical content of their speech and their ability to use language to talk about language (cited in Yaden and Templeton, 1986). Currently, metalinguistic ability has come to connote awareness of various aspects of language, such as grammatically, lexical items, phonemes, rhetorical devices, and awareness of speech and print regularities.

Within the past two decades, metalinguistics has received much attention in regard to reading readiness and beginning reading. Researchers are seeking to determine which metalinguistic skills are prerequisites to learning to read, and how linguistic awareness improves as a child matures and engages in the process of reading. Although the work of Pick, Unze, Brownell, Drozdal and Hopmann (1978) and others suggest that at least some aspects of metalinguistic awareness are prerequisite for learning to read, other researchers have concluded that the process of learning to read is in itself responsible for raising children's awareness of language (Reid, 1966; Rozin, Bressman, and Taft, 1974). Ehri (1975) states that a certain amount of metalinguistic awareness is required before a child learns to read and that learning to read will in turn increase the child's awareness. A study by Lundberg and Torneus (1978) provided evidence that the acquisition of metalinguistic skills is developmental and not solely dependent on formal reading instruction.

Some researchers hold an interactive perspective in regards to the acquisition of metalinguistic skills. This interactive theory states that metalinguistic awareness is a result of natural development <u>and</u> the process of learning to read (Downing, 1971-72).

Research in the area of metalinguistic awareness has considered many different aspects of linguistics and reading. These include studies in the awareness of sounds, phonemes, syllables, words, sentences, and language terminology. To literate adults the "word" appears as an obvious unit of language. For prereaders and beginning readers this phenomenon is not clearly understood. A listener/speaker has little need to think in terms of word units. Ideas form a continuous flow in speech so that to a child the phrase "peanut butter sandwich" represents a word in the same way "cow" does. But for written language users the unit formed by a word is crucial. It is necessary for readers to recognize the correspondence between the written and spoken word if they are to achieve success with reading. When the child begins formal reading instruction, the metalinguistic viewpoint, or the conscious, analytic view of language is emphasized. Since the basic unit for teaching reading is the word, children are expected to consciously identify as a discrete segment each instance of a word embedded in their own and their teacher's oral language, as well as in a line of print.

Research generally concludes that many children do not have an adequate concept of a word and that this lack of metalinguistic awareness is related to reading difficulties. Children prior to age five have a limited understanding of the meaning and function of a "word" (Downing, 1971-72; Reid, 1966). From the age of five or six, when most nations commence formal reading instruction, children's comprehension of a "word" improves steadily. Despite this general improvement most children between the ages of five and seven continue to have an obscure concept of the term "word" (Downing, 1971-72, Mickish, 1974). Children during this developmental and instructional period tend to recognize contentives (e.g. nouns, verbs, adjectives) as words, but apparently do not accept functors (e.g. articles and auxiliary verbs) as words (Ehri, 1975). Holden and MacGinite (1972) and Mickish (1972) have found that prereaders and beginning readers are not able to utilize the spaces separating printed words within a sentence as cues in defining what is meant by the term "word." Ehri (1975) and Holden and MacGinite (1972) have discovered that children have difficulty segmenting speech into word units. The results of these segmentation studies may have been confounded by the lack of knowledge of the metalinguistic term "word."

Two similar studies conducted by Rozin, Bressman, and Taft (1974) and Lundberg and Torneus (1978) tested young children's recognition of the relationship between sound duration and number of graphemes. Both studies observed a poor understanding of the relationship between spoken and written words.

Review of the Literature

Children's Conceptions of the Spoken and Written Word

Reid (1966) conducted an exploratory study with twelve children five years of age in order to investigate their general level of concept formation with regard to reading and writing. The children were individually interviewed at three times throughout their first year of school with questions directed at gaining understanding of the children's perceptions of reading. During the initial interview it was apparent that the children were unsure of the nature and function of reading, had little knowledge of the relationship between reading and writing, and lacked the proper terminology for describing the process and elements. For example, the children often referred to letters as "numbers," and said that words were made up of "words." As the year progressed the children's vocabulary of linguistic terms increased. The results of the second and third interviews showed that these steps were not quickly and easily taken. Reid observed:

> The children groped towards the necessary ordering elements at varying speeds and with varying degrees of success. Part of the success seemed to depend (as one would expect) on whether or not a child had at his disposal the vocabulary which would help him grasp the various schemata which even elementary discussion of language involves. (p. 61)

Downing (1971-72) replicated Reid's study. The purpose of Downing's study was to explore the general level of concept formation in five year olds with regard to reading and writing. Like Reid, Downing conducted loosely structured interviews with twelve children at three times during their first year of school. One interesting and significant variation in Downing's study was an activity which required the children to identify various auditory cues as either a "sound" or a "word." The auditory stimuli, which were tape recorded and presented individually to each child, included nonhuman sounds, phonemes, single words, phrases, and sentences. As the child heard each stimuli he was to respond either "yes" or "no" when asked whether he heard a sound or a word. The results revealed that most of the children interviewed at the beginning of the school year confused the definitions of the terms "word" and "sound." Surprisingly, many children identified the non-human sounds, such as a bell ringing, as "words."

Children who displayed more correct understanding of the definition of "words" and "sounds," indicating higher concept formation than the others, continued to develop at a faster rate. This was evidenced by a display of more improvement in concept clarity during the second and third phases of interviews than the other children tested. Based on his and others' studies, Downing theorized that there is a high correlation between cognitive clarity and reading success. Such a theory has been stated formally by the researcher as follows:

> The task of mastering the skill of reading poses a very complex problem to be solved by the child. Thus the learning-to-read process consists in a series of discoveries of solutions to the sub-problems which constitute the total complex problem of finding out how to read. In other words, progress in literacy acquisition is made by a series of cognitive restructurings which result from the learner's probes made in the course of his search for solutions. Sometimes the new cognitive structure will be a correct solution, but at other times it will be in error. As the child's attempted solutions approximate more and more closely to the reality of each aspect of the reading process, so he will achieve more and more cognitive clarity. Therefore, the best measure of a child's progress in solving the learning-to-read problem should be his degree of understanding of the nature of the task. Thus cognitive clarity will be correlated most highly with reading success, while failure in reading will have its chief symptom cognitive confusion. (p. 18)

Downing (1973-74) replicated his study employing the "yes/no" game with a larger number of children and with a wider age range (from 4.5 to 8.0 years). The subjects were provided with both thorough introduction to the study and practice sessions which simulated the actual procedure of the experiment. The auditory stimuli presented consisted of abstract non-verbal sounds (e.g. dice rattling), identifiable real-life non-verbal sounds (e.g. cat meowing), isolated phonemes, syllables, short words, long words, phrases, and sentences. By presenting long and short words it was possible to assess whether the cue word length was used by young children in evaluating whether or not a group of spoken sounds constituted a "word." A study by Pick, Unze, Brownell, Drozdal, and Hopman (1978) revealed that children visually identified written strings of letters as words based on word length.

Many of the youngest children (ages 4.5 to 5.5 years) incorrectly identified the sentences, phonemes, syllables, and non-verbal sounds as words. The intermediate group (ages 5.5 to 6.5 years) were the only group to have significantly fewer correct responses to long words than to short words. The oldest group (ages 6.6 to 8.0 years) had a significant number of incorrect responses to the isolated phonemes and syllables. Surprisingly, only one of the fourteen oldest children recognized that phonemes were not words, and none of them recognized that syllables were not words.

The results of this study tend to confirm previous findings that young children do not have an adequate concept of what constitutes a spoken "word" (Downing, 1971-72, Reid, 1966). This study indicates that as children grow older their concept of the term "word" improves. It cannot be concluded from this study whether this improvement in linguistic awareness is attributed to developmental age, cognitive development, or familiarity with the learning-to-read process.

Bowey, Tunmer, and Pratt (1984) criticized that previous research may have confounded children's understanding of "word" with their requirement to carry out dual classification tasks. These researchers simplified the tasks included in Downing's study for analyzing children's discrimination between sounds and words to insure its validity with the preschoolers, first, and second graders involved in the study. While the children in this research project performed better than those in previous studies, results indicated that preschool children experienced considerable difficulty in correctly labeling words and sounds and that there was a gradual refinement of children's understanding of the term "word" as they increased in age. The findings also showed that children's performance on this aural discrimination task was enhanced by training at all grade levels.

A study by Pick, et al. (1978) conducted with children ages three to eight years of age assessed their knowledge of the characteristics of printed words. The children were shown diverse letter strings and were asked whether each was a word. The letter strings included actual words of varying lengths, meaningful three letter initials (e.g. ABC, USA), scrambled letters of varying lengths, and words with misoriented letters (e.g. upside-down, backward). The very youngest children accepted a high percentage of all items as words with an exception of the single-letter words. Thus, nursery school aged children were inclined to define words as having multiple letters. The kindergarteners indicated a knowledge of letters having a correct orientation (position and direction on the paper). Words were generally identified by kindergarteners according to word length. The first through third graders were much more sophisticated in their methods of identification. Meaning was used as criterion for identifying words. For example, they rejected pronounceable non-words and unfamiliar words. They also rejected the three-letter sets of initials more frequently than the younger children. The researchers concluded that children do have some accurate knowledge about the characteristics of printed words before they begin to read.

In a project by Taylor, Blum and Logsdon (1986) fourteen preschool teachers were trained to implement a classroom environment where children could develop initial literacy concepts easily and naturally. The most important goal of this project was to teach children that written language is functional. A second goal was to facilitate through discovery understanding of the concepts "word," "letter," and "sound." The classrooms were rated by the researchers in relation to the degree to which they appeared to be language- and print-rich. The students from the classrooms where the program was implemented effectively outperformed the students from the non-implementing classrooms on the total battery of the Written Language Awareness Test and on the three subtests: the Aural Word Boundaries Test, the Metalinguistic Interview Test, and the Rye-Rhinocerous Test. The research concluded that a literacy-rich environment and directed teaching will enhance the metalinguistic skills of prereaders.

Children's Conceptions of Word Boundaries in Speech and Print

Holden and MacGinite (1972) conducted an experiment which evaluated kindergarten children's conceptions of word boundaries in speech and print. Each of the children received from twelve to twenty phrases or short sentences to segment into words. The examiner placed eight poker chips on the table and played a tape recorded utterance. Each child was individually asked to repeat the phrase or sentence and simultaneously tap one poker chip for each word. As in the Ehri (1975) study, Holden and MacGinite found the most common error among the children was to compound a function word with the following content word.

Fifty-seven of the original eighty-four children who had participated in the "talking and tapping game" also engaged in an experiment to test their conceptions of the correspondence between segmented utterances and their written versions. Following the auditory stimulus each child proceeded in the tapping procedure as he had in the previous experiment. This time, however, he was also required to count the number of chips tapped. Then he was presented with four written forms of the sentence (only one of which was segmented correctly) and asked to identify the correct sentence. The results of this study indicated that the subjects were quite unaware of the printing convention. In the segmentation exercises the children seemed to be influenced by the rhythmic structure of the utterance. The researchers interpreted their findings:

> Clearly, a first-grade teacher cannot take for granted that children will understand her when she talks about "words" and their printed representation. Nor can she assume that the concepts can be quickly and easily taught, since printed word units do not correspond to the way the child thinks the utterance should be divided. (p. 556)

Leong and Haines (1978) also conducted a segmentation study involving a tapping task. Seventy-two children in first, second, and third grades segmented words into syllables and syllables into phonemes by tapping a wooden dowel on the table. Results showed that although there was a significant variation in ability across each grade level to segment words into syllables, there was an overall poor performance of all groups in segmenting syllables into sounds. Each of the grade levels also found it difficult to repeat the high complexity sentences. The researchers summarized:

> For many children, their awareness of words and sentences is at the subsidiary level. Their acquisition of verbal skills is facilitated if their understanding is brought to the focal level. The contemplation and manipulation of words and sentences...will go some way towards helping the child in the learning to read process. (p. 405)

Mickish (1974) examined first grade children's perceptions of written word boundaries after one year of reading instruction. The students were asked to mark word boundaries in a written sentence presented with no spaces between words. The words contained in the sentence were familiar to the students (Thecatandthedogplayball) and a tape recording of the sentence was played continuously while the students marked the word boundaries. The data showed that many children who had completed one year of reading instruction manifested little comprehension of what constitutes a word and that words are bound by spaces. The study also indicated that as the subjects became better readers, they were more proficient at marking word boundaries.

Children's Conceptions of the Relationship Between Speech and Print

Rozin, Bressman and Taft (1974) developed the MOW-MOTORCYCLE Test to determine whether children understood the basic relationship between speech and writing. The study was conducted with children from kindergarten to second grade (n=218). Thirty-five subjects attended a suburban kindergarten, while all other subjects were selected from inner city urban schools. The objective of the study was to test young students' knowledge of sound-tracking by determining whether they understood that longer words generally take longer to say. The children were individually shown pairs of long words (9-11 letters, e.g. MOTORCYCLE) and short words (3-4 letters, e.g. MOW). Each of the word pairs shared the same initial letters and both words were printed on one card. Half of the cards presented the longer word on top and half of them listed the shorter word first. Also, half of the directions required the child to identify the longer word, while half focused on the shorter word. For each pair, each word was read by the examiner (e.g. "One of these words is MOW. the other is MOTORCYCLE") and then the child was asked which written word corresponded with one of the spoken words (e.g. "Which word is MOW?"). In most instances the child was asked to repeat the target word before identifying it on the word card. The child would then point to the corresponding word.

Following the set of eight such word pairs, the examiner briefly interviewed the child to determine how he made his choices. If the child responded "because it was longer" or "it was shorter" credit was not given for understanding of the association between the spoken and printed word. A correct response was given when a child gavé some explanation that there was a relationship between the word's written and spoken length.

In order to exclude the possibility of the letters themselves becoming a distraction by students trying to decode the words rather than focusing on word length. fifty-two of the students were given a box-test. Rather than being presented with typed word pairs on index cards, the words were formed with plastic moveable letters placed in boxes. Long words were placed in the longer box, while short words were placed in the shorter box. The children only viewed the letters of the sample word pair. After the practice session, the words were formed within the boxes, and the covers were placed on them. The examiner then told the child the two words and asked him to point to the box containing the target word. The word pairs were presented in the same order as in the word-test.

There was no significant difference between the responses on the word-test and the box-test, indicating that the concept "word length" was accurately measured by the word-test method and that the students were not distracted by the letters on the cards. This suggests that the MOW-MOTORCYCLE word-test is a valid instrument for measuring a child's concept of the correspondence between written and spoken word length.

The researchers had established two criteria for evaluating the subjects' responses on the test. Children met the strict criterion when they correctly responded to seven or eight of the word pairs. The weak criterion was met when six or more correct responses were given. Very few students met the strict criterion. The group with the highest percentage in both the weak and strict criterion groups was the urban second grade, with a mean score of 7.20. The other groups who had a significant percentage of responses meeting the weak criterion were the suburban kindergarten and urban post-first grade groups. While 43% of the suburban kindergarteners met the strict criterion, very few urban kindergarteners did (8% and 11%). Furthermore, the scores improved from kindergarten through second grade, indicating that either understanding of the speech-print concept is developmental in nature--is acquired as reading skills are learned--or is an interaction of the two (Ehri, 1975).

Lundberg and Torneus (1978) conducted a precisely constructed study similar to the MOW-MOTORCYCLE Test, in which children's recognition of the relationship between sound duration and number of graphemes was tested. This research (Lundberg and Torneus, 1978) was conducted with one hundred non-readers in Sweden. Because formal reading instruction in Sweden is introduced at a later age, the experimenters were able to evaluate the linguistic ability of nonreaders from four years to seven years of age. Since the subjects had not yet received reading instruction and therefore had not been influenced by the process of learning to read, their developmental linguistic abilities have been very accurately examined in this study.

As in the MOW-MOTORCYCLE Test the children were presented with word pairs containing one long word and one short word. A main experimental variable introduced in this study was the altering of the relationship between the number of graphemes and the size of the denoted object (semantic congruence). The seventy-two word pairs were categorized by the researchers as being either semantically congruent, neutral, or incongruent. The word pairs qualified as being congruent if there was a similarity between the length of the word and the size of the object, for example "arm-ambulance" (arm-ambulans), where the short word denoted a small object and the long word represented a large object. A neutral relationship existed in a word pair when the two words represented objects of approximately the same size. The word pairs were considered incongruent when there was a direct contrast between the length of the word and the size of the object, for example, "pine-tennis racket" (tall-tennisracket), where the short word denoted the larger object. This countersuggestive condition was included in order to reveal the children's semantic strategies, to determine whether they relied on semantic cues rather than focusing on the auditory and printed length of the words. The researchers theorized that the probability of making a correct choice would increase when the words were semantically congruent. Therefore, in an incongruent word pair a correct selection would require an attention shift from semantics to a focus on the formal properties. The incongruent word pairs more precisely evaluated the subjects' abilities to identify a word based solely on auditory duration and grapheme length.

As hypothesized, the children in all age groups made the correct word selection most often when the word pairs were semantically congruent, indicating that reliance was placed on the meaning of the words. The mean proportion of correct responses was lowest with the incongruent words for all age levels. These results imply that all age groups tested (ages 4-7) had utilized semantic cues in their selections.

Some of the long words used in this study were compound words. Pairs containing a compounded long word had a significantly higher proportion of correct choices than pairs with non-compounds as long words (Lundberg and Torneus, 1978). Compound words are probably easier to analyze into parts, which might emphasize the impression of length.

Lundberg and Torneus also systematically varied the vowel duration of the word pairs since it was suspected that the vowel duration, especially in initial or stressed parts of a word, would affect the subjective impression of word length. The word pairs were labelled either congruent, neutral, or incongruent in reference to vowel duration (long or short vowel sounds) of the words within each pair. The results of this study revealed no significant influence of vowel duration on the recognition of the relationship between word duration and number of graphemes.

The researchers questioned the children periodically throughout the testing procedure about their reasons for making their word choices. The responses were categorized by age level as follows:

* Explanations indicating proper understanding (e.g., "Pine sounds shorter than tennisracket, so that must be 'pine'," pointing at the word 'pine').

* Explanations referring to letter utilization (e.g., "The last sound in ball is 'l' and the last letter in that word is 'l'").

* Explanations referring to object size (e.g., "A cat is smaller than a carousel").

* Explanations referring to temporal-spatial-order relationship (e.g., "You always read the upper word first").

* Ambiguous explanations (e.g., "Because that word is smaller").

* Irrelevant or no explanations (e.g., "My finger wants to point at that word" or "I don't know"). (p. 410)

The overall results of this study revealed an increase in linguistic awareness with age, yet only eighteen of the entire group of one-hundred children demonstrated a full understanding of the sound orthography principle, indicated by a strict criterion of 90% of correct responses. The selection behavior of the youngest group of children was characterized by a complete lack of connection between the target word and choice. The five year old children were better able to explain their choices, although often their selections were incorrect. The six year olds often relied on semantic cues and described this strategy in their explanations. Quite a few children in the oldest group (seven years of age) manifested poor conceptualizations of the basic relationship between sound duration and number of graphemes.

The Correlation Between Metalinguistic Ability and Reading Achievement

Downing (1971-72) recognized a high correlation between cognitive clarity and reading success. His research revealed that children who are aware of their abilities to manipulate language had greater success in the learning-to-read process than those who manifested cognitive confusion. This theory was supported by the findings in a segmentation study by Leong and Haines (1978). These researchers concluded that. "The contemplation and manipulation of words and sentences... will go some way towards helping the child in the learning to read process" (p. 405). Other studies (Ehri, 1975) have been directed at identifying the correlation between metalinguistic awareness and reading achievement.

The intention of Ehri's study (1975) was to seek evidence that learning to read brings about a major change in a child's metalinguistic knowledge, specifically his awareness of lexical constituents of speech. Ehri tested thirty-five children with ages ranging from 4.4 years to 7.8 years of age at the end of the school year. The various tasks employed aimed at identifying the metalinguistic skills of each child. Task One required the subject to use a given word in a sentence. Task Two was a sentence segmentation activity. in which the children segmented verbally presented sentences into syllables and words by tapping and laying down chips. Sentences in the third task were also presented verbally to the child, but in this activity the examiner engaged the use of a puppet. The examiner said a sentence, then the "puppet" repeated the sentence with a change in it. The purpose of Task Three was to determine if a child could identify the change in the sentence (e.g. a misplaced or changed word). In Task Four the children listened for a particular syllable embedded in a word within a spoken sentence. The fifth task measured reading ability. The results from Task Five were used to separate the readers from the prereaders for comparison purposes.

The results of this study showed that beginning readers were more successful than prereaders in recognizing isolated words and embedding them in sentences or phrases. The prereaders displayed semantic errors and confusion between words and syllables. The segmentation task revealed that readers were more successful at analyzing sentences according to words and syllables than either preschoolers or kindergarteners.

Prereaders were observed to omit many more marks for function rather than content words. There was also evident confusion between word and syllable analysis among prereaders. On Task Three the results indicated that readers were superior to prereaders in their ability to compare sentences in terms of the words which distinguish them. The word selection task in which the subjects identified syllables embedded in words within sentences revealed that readers and prereaders focus on the beginning sounds of words in their analysis. Ehri stated:

> These findings combine to suggest that readers, in contrast to prereaders, possess substantial conscious awareness of lexical as well as syllabic constituents of speech, and that readers' knowledge of function words is especially advanced relative to that of prereaders. (p. 211)

Ehri suggested that the differences in metalinguistic ability between readers and prereaders is related to the child's experience with printed correlates of spoken forms and learning how speech is represented in print. Learning to read, which often occurs around age seven, seems to sharpen children's lexical awareness. Prior to first grade children encounter little need to focus on the printed word. In a linguistically rich environment where children's attention is directed to the printed word daily, an understanding of lexical units may develop. Extensive research has led Ehri to conclude that an early implicit concept of the correlation between print and speech may result in a conscious awareness of lexical units at a much earlier age. Ehri summarized this theory as follows:

> In the interpretation given the results of the present study, it is asserted that the lexical constituents of language are known implicitly by the child as a consequence of his linguistic competence and that exposure to printed language brings these units to awareness and enables the child to analyze and reflect upon the components of his speech. (p. 211)

In an extensive review of research, Gibb and Randall (1988) concluded that there is a strong correlation between grapheme-phoneme correspondence and reading success. They analyzed individual phoneme segments embedded within words, rather than whole words and their corresponding sounds. Their research indicated that this metalinguistic concept is necessary for learning to read, that it is developmental, and that it can be taught. The researchers concluded:

> The evidence shows that phonemic awareness bears a significant relationship to the acquisition of reading. There is, then, a case to be made for the explicit training of phonemic awareness as a pre-reading skill, so that some level of insight can be established before the potentially confusing grapheme is introduced. (p. 140)

A study conducted by Ryan, McNamara, and Kenney (1977) revealed that performance on all linguistic awareness tasks, except Word Tapping, reflected greater linguistic abilities in better readers and lower linguistic abilities in poor readers. The results of first and second graders on the linguistic awareness activities were quite similar to those of older remedial reading students. This indicates that a slow development of linguistic awareness skills may be correlated to a delay in the development of reading skills.

The linguistic and reading abilities of average and poor readers were also compared in a study by Huba and Kontos (1985). Second grade average and poor readers were administered the Print Awareness Test developed by Marie Clay and a modified MOW-MOTORCYCLE Test. Results on these tests revealed a correlation between metalinguistic ability and reading achievement. although it was reported that scores were slightly influenced by the students' socioeconomic status. The poor readers had obtained statistically significant lower scores on the Print Awareness Test. There was a small mean difference between the two groups on the MOW-MOTORCYCLE Test.

Ganople (1987) investigated the development of word consciousness prior to first grade and the relationship between word consciousness and reading ability. Results of this study showed that both reading level and age do contribute significantly to the prediction of performance on the word concept measure. These findings strongly support the developmental nature of the concept of the <u>word.</u> although distinct stages of development have not been identified.

Segmentation abilities and their relationship to reading achievement has been investigated. The researcher, Allan (1982), summarized the results of this study as follows:

> The results of the investigation into children's segmentation ability support the inference that children with increasing reading abilities exhibit increasing proficiency in their ability to segment words in the aural and visual contexts. (p. 91)

Bialystok (1988) examined two metalinguistic skill components for their relative contribution to reading comprehension. The two processing components were identified as analysis of knowledge and control of linguistic processes. Analysis of knowledge is the skill component responsible for structuring, organizing, and explicating the child's implicit knowledge of language. It was theorized by Bialystok that children's knowledge of language moves from implicit, to explicit but not conscious, and finally, to explicit and able to be reflected upon. Some examples of metalinguistic analysis of language are correcting sentences, segmenting text, and producing responses to fit categories, such as rhyme or synonym.

Control of linguistic processing is the skill component through which information is selected and integrated for a response. An example of this skill is the ability to adjust strategies according to the linguistic input, such as varying reading strategies for different forms of text. Counting the number of words in a sentence is also an example of linguistic control because attention is focused on the separate words rather than on the meaning.

The metalinguistic tests administered were oral tests of linguistic sensitivity and involved no reading or printed material. The subjects were also given a standardized measure of reading comprehension. Results of this study show that the level of reading comprehension could be predicted by the level of the child's metalinguistic analysis of language.

Bowey and Patel (1988) challenged the findings of Bialystok's study, arguing that metalinguistic skill does not predict reading achievement independent of general language ability. Since the general language ability of the subjects were statistically controlled in this study, the independent metalinguistic skills did not powerfully predict reading achievement, particularly reading comprehension. The researchers did find a correlation between syntactic awareness and word decoding. Therefore, metalinguistic skills, when recognized as an element of general language ability, are related to reading achievement.

The unanswered question remains: Does metalinguistic ability facilitate the learning-to-read process? Does the learning-to-read process enhance metalinguistic awareness? Or, is there a natural interaction between the two, allowing both to develop concurrently? Metalinguistic skills may be facilitative, consequential, or correlative. The practical application is that metalinguistic awareness and reading are related, that children gain metalinguistic understanding gradually, and that metalinguistic skills can be taught prior to formal reading instruction.

Chapter III

Research Design

Purpose

The purpose of this study is to explore and document the development of young children's conceptions of the correspondence between the auditory duration and grapheme length of a word.

Hypothesis

It is hypothesized that children's conceptions of the correlation between the auditory duration and grapheme length of a word is developed and will increase with age and that there will be a statistically significant difference between the metalinguistic abilities of children who have not received formal reading instruction and those who have.

Design of the Study

The subjects were comprised of preschoolers (n=26), kindergarteners (n=40), and first graders (n=34) from private suburban schools located in western New York State.

The materials needed for this study included twenty-one word pair cards comprised of pseudowords and words generally not present in young children's vocabularies (see Appendix A). Unfamiliar words have been used in order to prevent the use of semantics in their word selections. In order to avoid the use of decoding skills each word pair had the same initial and ending letters. Spelling of the words had been modified so the pairs appeared graphically similar. Each word was typed in upper case letters in order to maintain their uniform appearance. The words have been typed one above the other on the upper left hand corner of an unruled index card.

Twenty cards were used for testing and one card was used for demonstration. Each word pair included one long word and one short word. Ten cards displayed the long word on top and ten cards presented the short word on top. The long words contained seven to eleven graphemes and consisted of three or more syllables. Compound words were not employed because research suggests that they appear to be easier to analyze into parts, which might emphasize the impression of length (Luhdberg and Torneus, 1978). The short words contained three to four graphemes and were monosyllabic.

A chart for recording the students' explanations of word choices was also needed. The chart was for the examiner's use only. (See Appendix B)

Each student was individually tested at the end of the school year. The examiner explained the procedure to each child, using the sample word pair. In the demonstration the examiner explained, "Each card will have two words on it. They are nonsense words so don't try to figure out what they mean. I will read both words. Sometimes I will read the word on top first. Sometimes I will read the word on the bottom first (pointing at each word). Then I will ask you to point to one of the words on the card." During the demonstration the child was corrected if he chose the wrong word. During the actual testing, however, the examiner responded to both correct and incorrect answers with encouraging comments such as, "ok," and, "you're doing fine."

During the testing activity the child was required to find the long word one-half of the time and the short word one-half of the time. Also, the location of the target word on the card was counterbalanced. One-half of the time the target word was on the top of the card and one-half of the time it was located underneath the first word. The examiner read both words, then asked the child to point to the target word. The words were presented in the same order to each child tested.

Periodically during the testing session, the researcher asked each child to explain how he made his choices. Each child's explanation was recorded on the chart listing the categories of explanations (see Appendix B) If a child initially responded that he didn't know how he made his choices, but later was able to produce the explanation, the latter explanation was recorded.

Summary

The purpose of this study was to analyze the development of one specific metalinguistic skill--comprehension of the correspondence between auditory duration and grapheme length. The three grade levels which have been evaluated are four year old preschoolers, kindergarteners, and first graders.

Students were examined individually by this researcher at the end of the school year. Each child was presented with twenty word pairs. Each word pair contained one long word and one short word. The test was designed to initiate a response based on word length rather than reliance on semantic or phonetic cues. Each student was asked to give an explanation for his responses. The results have been analyzed to compare responses of individuals within each age group. The mean scores of each group have been analyzed to identify if there is a statistically significant difference between age groups.

Chapter IV

Analysis of Data

Purpose

The purpose of this study is to explore and document the development of young children's conceptions of the correspondence between the auditory duration and grapheme length of a word.

Findings

The preschool group (n=26) consisted of students with ages ranging from 4.0 to 5.42 years. The mean age was 4.71 years. The mean number of correct responses for the group totalled 11.6, with scores ranging from seven to twenty. Three students (12%) obtained a score of 90% or above. Of these students who met the strict criterion one student provided an ambiguous explanation for his word choices, stating, "Because it was little." One student (with a score of eighteen) answered the sample question incorrectly. His word choices improved as the examination proceeded. When asked how he made his word choices, he referred to letter utilization. The third student who met the strict criterion obtained a perfect score of twenty, yet when asked to explain how she made her word choices she responded, "I don't know."

Twenty-three of the preschoolers (88%) obtained scores lower than 90%. Two of those students provided explanations related to word length, but not indicating a complete understanding of the speech-print relationship. One student (with a score of ten) provided an explanation referring to the words' temporal-spatial-order relationship. The remaining twenty students provided no relevant explanation. Some responses were, "I guessed," "Because I know everything on the cards," "I just think real hard," "I'm a clever boy," "Mom teached me," and the majority responded, "I don't know." None of the preschoolers provided explanations indicating an understanding of the correspondence between auditory duration and grapheme length.

The kindergarten classes (n=40) had an age range of 5.42 years to 7.25 years with a mean age of 6.18. The mean number of correct responses for the group totalled 17.95. The range of responses was eight to twenty. Twenty-four of the forty students obtained a perfect score of twenty. A total of thirty students (75%) met the strict criterion of 90% correct responses.

Of the thirty students who met the strict criterion by answering at least eighteen questions correctly, only seven were able to accurately verbalize reasons for making their word choices, indicating an understanding of the speech-print relationship. These students were able to express that longer words took longer to say and that they appeared longer in print. One student mentioned that there are two "sounds" (syllables) in the long words and only one "sound" in the short words. Twelve of those students meeting the strict criterion provided ambiguous explanations. Each of those students described the length of the words in their explanations, but were unable to verbalize understanding of the relationship between auditory length and grapheme length. For example, one student stated, "One word is short, and one word is long." Another student responded, "Because it's a long word."

Two of the students meeting the strict criterion provided more than one explanation for their word choices. In both instances the students made word choices according to the sound orthography principle and decoding strategies. Nine students who had at least 90% correct word choices were unable to provide any relevant explanations for the choices made. Some responses by these students were, "I know how to read," "I just think," "I'm smart," "I have a mind," and "I don't know."

Of the thirty kindergarten students who obtained a score of at least 90% on the Speech-Print Matching Test, seven were able to accurately describe the speech-print relationship, twelve provided ambiguous explanations, two employed more than one strategy in making their word choices, and nine were unable to describe their strategies.

The remaining ten students (25%) who had fallen below the strict criterion provided various explanations. One student, who received a total score of only eleven, was able to accurately describe the correspondence between the auditory length of the words and their grapheme length. One student (with a score of sixteen) gave an explanation referring to letter utilization (ie., "It has no 'n' in it"). One student employed more than one strategy, and seven students were unable to provide relevant explanations for their choices.

The first grade classes (n=34) consisted of students with ages ranging from 6.42 years to 8.42 years. The mean age was 7.33 years. The mean number of correct responses for the group totalled 19.62, with scores ranging from sixteen to twenty. Thirty-two students (94%) met the strict criterion, while only two students failed to achieve a score of 90%. Twelve of the students (35%) who met the strict criterion provided explanations indicating proper understanding of the speech-print relationship. One student explained, "The one that sounds longest is longer on the card." Another student described the relationship in this way, "I listen to see which is longer, then I find the longer word on the card."

Fifteen students (44%) gave ambiguous explanations which referred to word length, but did not identify the association between auditory duration and grapheme length. Some examples of ambiguous responses were, "It's longer--you can hear it and count it in your head," "Because it has more 'words' (meaning letters)," "Little words are little, big words are big," and "Long ones have long words, short ones have short words."

Two students provided explanations referring to letter utilization. Two students (with scores of 20) gave explanations referring to the words' temporal-spatial-order relationship, such as, "It's on the top." Another student (with a score of twenty) was unable to provide any explanation for how he made his word choice. He stated, "I just guessed."

Of the two first grade students who failed to meet the strict criterion one student referred to temporal-spatial-order relationships in his explanations, and the other student provided an irrelevant explanation, "Because I look at it."

Thirty-two of the thirty-four first graders (94%) chose the correct words on the Speech-Print Match Test 90% of the time. Of those students, twelve were able to provide very clear explanations indicating proper understanding of the correspondence between the auditory duration and grapheme length of words. The two students who did not meet the strict criterion provided irrelevant explanations for their word choices.

In summary, twelve percent of the preschoolers, seventy-five percent of the kindergarteners, and ninety-four percent of the first graders met the strict criterion on the Speech-Print Matching Test. None of the preschoolers provided accurate explanations indicating an understanding of the speech-print relationship. Twenty percent of the kindergarteners and thirty-five percent of the first graders provided explanations indicating a clear understanding of the concept. Ambiguous explanations were provided by twelve percent of the preschoolers, thirty percent of the kindergarteners and forty-five percent of the first graders. Irrelevant and multiple explanations were given by eighty-eight percent of the preschoolers, fifty percent of the kindergarteners and twenty-one percent of the first graders. (See Appendix C)

Analysis and Interpretation of Hypothesis

Statistical Analysis

The Null Hypothesis states that there will be no statistically significant difference in the mean scores of the preschool, kindergarten, and first grade groups when tested at the 95% confidence level. An analysis of variance was calculated to determine if there was an overall statistically significant group difference. Since the "F" required for 2 and 97 degrees of freedom at the 95% confidence level is 3.93 and since the "F" obtained is 66.21, the Null Hypothesis is rejected, and we can conclude that there _is_ an overall statistically significant group difference. (See Appendix D)

A T-Test of significance was applied to the difference in the observed means for the three treatment groups. For 97 degrees of freedom, the smallest "T" which is significant at the 95% confidence level is 2.00. The T-Test based on the mean square for within-treatment groups determined the critical difference between means to be a critical value of 1.54.

Since the critical value is 1.54, and the difference in preschool and kindergarten means is 6.33, the Null Hypothesis is rejected, and we can conclude that there *is* a statistically significant difference between the preschool and kindergarten means.

Since the critical value is 1.54, and the difference in kindergarten and first grade means is 1.67, the Null Hypothesis is rejected, and we can conclude that there *is* a statistically significant difference between the kindergarten and first grade means.

Since the critical value is 1.54, and the difference in preschool and first grade means is 8.00, the Null Hypothesis is rejected and we can conclude that there *is* a statistically significant difference between the preschool and first grade means. (See Appendix E)

Word Selection Strategies

An analysis of word selection behaviors and explanations of the students was made to determine which strategies were employed by the students at each grade level on the Speech-Print Matching Test. The preschoolers' word choice strategies were characterized by a lack of connection between the target word and choice. Eighty-eight percent of the preschool students were unable to provide any relevant explanation for their word choices. Most of the preschool students responded that they didn't know how they had made their word selections. There was little pattern to their choices. Some students consistently chose the longest word. Some consistently pointed to the top or bottom word, while others alternated between the top and bottom words. Twelve percent of the students provided ambiguous explanations, indicating a vague concept of the task.

The kindergarten children's word selection strategies involved more focus and direction than the preschoolers. This was reflected in their mean score of 17.95. Twenty percent of the students provided very accurate explanations which indicated proper understanding of the speech-print relationship. Thirty percent of the students indicated some understanding of a relationship of word length, but did not adequately explain the speech-print relationship. Fifty percent of the kindergarten students had at least implicit knowledge of the concept. It was apparent during the testing that many kindergarteners attained the concept through practice while proceeding in the examination. Many of the kindergarteners lacked the proper terminology for describing words, often referring to words and letters as "numbers," and described words as being made up of "words."

The first graders were much more sophisticated in their word selections and explanations. Ninety-four percent of the students achieved a score of 90% or above. Thirty-five percent of the first graders were able to accurately describe the speech-print relationship. Another forty-four percent provided explanations which approximated accurate explanations, but did not fully describe the correspondence between the auditory duration and grapheme length. Therefore, the majority of first graders (79%) had at least implicit knowledge of the speech-print relationship. The first graders lacked the proper terminology for describing words and their functions. They referred to letters and syllables as "words."

In summary, the explanations of the preschoolers were characterized by a lack of ability to verbalize any strategies for making their word choices. The kindergarteners manifested focus and direction to their word selection choices. The majority of kindergarteners attempted to provide explanations for their word choices. Most of their explanations indicated a vague understanding of the concept. Their lack of skill in using proper terminology inhibited the accuracy of their explanations.

The first graders were more systematic in their word choices and better able to verbalize their explanations. The majority of the first graders gave vague, ambiguous explanations which referred to word length, but not accurately describing the speech-print concept. Their lack of skill in using proper terminology also inhibited the accuracy of their explanations.

Understanding of the Concept

The explanations at the preschool level did not reflect an understanding of the relationship between sound duration and number of graphemes in a word. Fifty percent of the kindergarteners provided explanations referring to word length. Twenty percent of that group provided accurate explanations of the concept. The majority of first graders (79%) gave explanations indicating at least an implicit knowledge of the concept. It is possible that many of the kindergarten and first grade students had an explicit knowledge of the concept, but did not have the verbal skills or technical vocabulary to describe their understanding of it.

Individual Differences

There were significant individual differences in metalinguistic abilities among children within each grade level. The preschool scores ranged from seven to twenty. The significant difference in this group applied to those students obtaining scores meeting the strict criterion of 90%. Only three students met the criterion.

The range of scores for the kindergarten group was eight to twenty, representing significant individual differences among the subjects. One student, with a score of only eleven, provided a very clear explanation of the speech-print relationship. In contrast, eight students with scores at or above eighteen did not provide any relevant explanation for their word choices. Therefore, the kindergarteners' word selections did not correspond with their explanations of the concept evaluated.

There were fewer individual differences among the first graders. Their differences appeared in the variety of explanations rather than in their scores. Thirty-five percent provided accurate explanations, forty-four percent gave ambiguous explanations, and twenty-one percent were unable to produce a single, relevant explanation for their word choices.

Summary

There was an increase in metalinguistic ability with each grade level. There was a statistically significant difference between the mean scores of each grade. The smallest difference occurred between the kindergarten and first grade means. The greatest difference occurred between the preschool and first grade means. The ability to provide accurate explanations for their word choices also increased with each grade.

Chapter V

Conclusions and Implications

Purpose

The purpose of this study is to explore and document the development of young children's conceptions of the correspondence between the auditory duration and grapheme length of a word.

Conclusions

It can be concluded from the results of this study that understanding of the correspondence between the auditory duration and grapheme length of a word is developmental and can be enhanced by direct reading instruction. The achievement scores on the Speech-Print Matching Test increased significantly with each grade level, the greatest difference occurring between preschool and kindergarten. Beginning readers were much more proficient than prereaders in their word selections. The word selection behaviors of the preschoolers were characterized by a total lack of connection between the target word and choice, which indicated little concept of the printing convention. The kindergarteners and first graders were more systematic in their word choices. They recognized a relationship between spoken and written word lengths and the presence of syllables in the long words.

This study supports previous findings that the process of learning to read raises children's awareness of language (Ehri, 1975; Reid, 1966; Rozin, Bressman and Taft, 1974). The students at each grade level manifested cognitive confusion, described by Downing (1971-72), as indicated by their irrelevant explanations for their word choices. The children at each level also lacked the proper terminology to describe words and their functions. This inability decreased with age, clarity of thought and speech becoming more evident in the older students.

Implications for Classroom Practice

The results of this study show that prereaders do not recognize the correlation between speech and print. A literacy-rich environment should be provided by teachers of prereaders and beginning readers in order to raise their awareness of print. Taylor, Blum, and Logsdon (1986) also concluded from their research that a literacy-rich environment and directed teaching will enhance the metalinguistic skills of prereaders. Ehri (1975) had suggested that the difference in meatalinguistic ability between readers and prereaders is related to the child's experience with printed correlates of spoken forms and learning how speech is represented in print.

Students engaged in the Speech-Print Matching test often chose the wrong word on the sample card, and after being corrected only once, focused on the qualities of the words and attained the concept during the testing procedure. This supports research by Bowey, Tunmer, and Pratt (1984) which stated that children's performance is enhanced by training at all grade levels.

Instruction in language awareness should include teaching the proper terminology associated with language, such as, "words," "letters," and "syllables." Leong and Haines (1978) had theorized that awareness of words is at the subsidiary level and that their acquisition of verbal skills is facilitated if understanding is brought to the focal level.

Morris (1981) recommended several activities for the teaching and enhancing of the concept of a word. Memorization and repetitive reading of familiar nursery rhymes while the teacher models finger-pointing will encourage children to focus on the auditory-grapheme relationship. Morris also listed behaviors that teachers can assess in their students which indicate their level of word concept. This sequence of behavior assessment may also be applied to "shared-book experiences" which are often an integral part of the whole language curriculum. Dictated experience stories also provide a useful medium for observing early reading behaviors. Emphasis in reading instruction should focus the child's attention on whole words within the context of the story rather than on individual phonemes which fragment words. This linguistic instruction would give children a better chance of inferring that the relationships between speech and print are ordered and systematic, thus enhancing their reading development.

Implications for Research

Different approaches to this study might be investigated. A study could assess the development of understanding the correspondence between auditory duration and grapheme length with groups of children from two different socioeconomic areas. Results of that study would show the affects of environment on the metalinguistic abilities of children.

Another study which might be conducted is to compare beginning readers' scores on the Speech-Print

Matching Test with their achievement scores on a reading assessment. Results would measure the correlation of this metalinguistic skill with reading progress.

Summary

The ability to recognize the correspondence between auditory duration and grapheme length is developmental and enhanced by direct reading instruction. Development of linguistic abilities in young children may be facilitated providing a literacy-rich environment and direct teaching. The refinement of metalinguistic awareness will result in further growth in reading.

References

<u>Reference List</u>

Allan, K.K. (1982). The development of young children's metalinguistic understanding of the word. <u>Journal of Educational Research, 76,</u> 89-92.

Bialystok, E. (1988). Aspects of linguistic awareness in reading comprehension. <u>Applied Psycholinguistics, 9,</u> 123-139.

Bowey, J.A. & Patel, R.K. (1988). Metalinguistic ability and early reading achievement. <u>Applied Psycholinguistics, 9,</u> 367-383.

Bowey, J.A., Tunmer, W.E. & Pratt C. (1984). Development of children's understanding of the metalinguistic term word. <u>Journal of Educational Psychology, 76,</u> 500-512.

Downing, J. (1971-72). Children's developing concepts of spoken and written language. <u>Journal of Reading Behavior, 4,</u> 1-19.

Downing, J. & Oliver, P. (1973-74). The child's conception of a 'word'. <u>Reading Research Quarterly, 9,</u> 568-582.

Ehri, L.D. (1975). Word consciousness in readers and prereaders. <u>Journal of Educational Psychology, 67,</u> 204-212.

Ganople, S.J. (1987). The development of word consciousness prior to first grade. <u>Journal of Reading Behavior, 19,</u> 415-436.

Gibb, C. & Randall, P.E. (1988). Metalinguistic abilities and learning to read. <u>Educational Research, 30,</u> 135-140.

Holden, M.H. & MacGinite, W.H. (1972). Children's conceptions of word boundaries in speech and print. <u>Journal of Educational Psychology, 63,</u> 551-557.

Huba, M.E. & Kontos, S. (1985). Measuring print awareness in young children. <u>Journal of Educational Research, 78,</u> 272-278.

Leong, D.K. & Haines, D.F. (1978). Beginning readers' analysis of words and sentences. Journal of Reading Behavior, 10, 393-407.

Lundberg, I. & Torneus, M. (1978). Nonreaders' awareness of the basic relationship between spoken and written words. Journal of Experimental Child Psychology, 25, 404-412.

Mickish, V. (1974). Children's perceptions of word boundaries. Journal of Reading Behavior, 6, 19-21.

Morris, D. (1981). Concept of a word: A developmental phenomenon in the beginning reading and writing processes. Language Arts, 58, 659-667.

Pick, Unze, Brownell, Drozdal, & Hopmann. (1978). Young children's knowledge of word structure. Child Development, 49, 669-680.

Reid, J.F. (1966). Learning to think about reading. Educational Research, 9, 56-62.

Rozin, P., Bressman, B., & Taft, M. (1974). Do children understand the basic relationship between speech and writing? The mow-motorcycle test. Journal of Reading Behavior, 6, 327-334.

Ryan, E.B., McNamara, S.R. & Kenney, M. (1977). Linguistic awareness and reading performance among beginning readers. Journal of Reading Behavior, 9, 399-400.

Taylor, N.E., Blum I.H., & Logsdon D.M. (1986). The development of written language awareness: Environmental aspects and program characteristics. Reading Research Quarterly, 21, 132-148.

Templeton, S. & Spivey, E.M. (1980). The concept of word in young children as a function of level of cognitive development. Research in the Teaching of English, 14, 265-277.

Templeton, S. & Thomas, P.W. (1984). Performance and reflection: Young children's concept of word. Journal of Educational Research, 77, 139-145.

Tunmer, W.E., Pratt, C., & Herriman, M.L., (Eds.). (1984). Metalinguistic Awareness in Children. New York: Springer-Verlag.

Yaden, B. & Templeton, S. (Eds.). (1986). Metalinguistic Awareness and Beginning Literacy: Conceptualizing What It Means to Read and Write. New Hampshire: Heinemann Educational Books, Inc.

Appendices

APPENDIX A

WORD LIST FOR THE SPEECH-PRINT MATCHING TEST

A. DYNE
DYNANINE (sample)

1. CREE
CONFEREE

2. QUADRILOD
QUAD

3. EYTE
ERYTHROCYTE

4. SARDONARD
SARD

5. PRONEPHROS
PROS

6. PIEDINIED
PIED

7. DRAF
DRAMILAF

8. EFT
EFFELLECT

9. PHOSPHORLOT
PHOT

10. WROLEREN
WREN

11. ETCH
ETHELETCH

12. OMM
OMMATIDIUM

13. DYS
DYSINTHIS

14. HYLOISM
HYSM

15. FEUD
FENILEUD

16. ERG
ERINBURG

17. SOLINOID
SOID

18. LYTE
LYTONITE

19. SKENNEREW
SKEW

20. PALINDROME
POME

APPENDIX B

CHART FOR RECORDING STUDENT EXPLANATIONS

1.) Explanations indicating proper understanding (e.g., "TUP sounds shorter than TULLERUP, so that must be 'TUP', pointing at the word 'TUP').

2.) Ambiguous explanations (e.g., "Because that word is smaller").

3.) Explanations referring to letter-utilization (e.g., The last sound in GALL is 'l' and the last letter in that word is 'l'").

4.) Explanations referring to temporal-spatial-order relationship (e.g., "You always read the upper word first").

5.) Irrelevant or no explanation (e.g., "My finger wants to point at that word" or "I don't know").

6.) Uses more than one strategy listed above.

APPENDIX C

RECORD OF RESPONSES

	GRADE		
	PRESCHOOL	KINDER.	FIRST
N =	26	40	34
AGE RANGE	4.00-5.42	5.42-7.25	6.42-8.42
MEAN AGE	4.71	6.18	7.33
RANGE OF SCORES	7-20	8-20	16-20
MEAN SCORE	11.60	17.95	19.62
# MEETING 90% CRITERION	3	30	32
% MEETING 90% CRITERION	12	75	94
# of ACCURATE EXPLANATIONS	0	8	12
% of ACCURATE EXPLANATIONS	0	20	35
# of AMBIGUOUS EXPLANATIONS	3	12	15
% of AMBIGUOUS EXPLANATIONS	12	30	44
# of IRRELEVANT & MULTIPLE EXPL.	23	20	7
% of IRRELEVANT & MULTIPLE EXPL.	88	50	21

APPENDIX D

SOURCE TABLE

SOURCE	DF	SS	MS	F
BETWEEN	2	1021.23	510.61	66.21
WITHIN (ERROR)	97	748.08	7.71	-----
TOTAL	99	1769.31	------	-----

APPENDIX E

TABLE OF DIFFERENCES

	PRESCHOOL	KINDERGARTEN	FIRST GRADE
PRESCHOOL	-----	* 6.33	* 8.00
KINDERGARTEN		------	* 1.67
FIRST GRADE			-----